D1MNM115

100V N-Channel MOSFETs

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	115 mΩ	12 A

General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

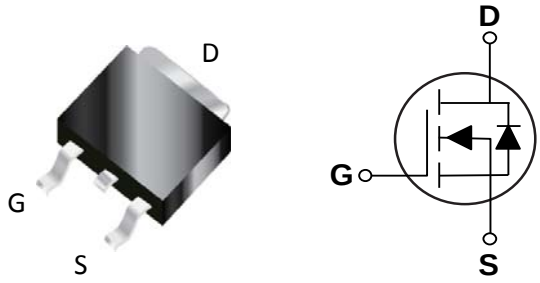
Features

- 100V, 12A, $R_{DS(ON)}$=115mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications

TO-252 Pin Configuration



Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current - Continuous (T_C=25°C)	12	A
	Drain Current - Continuous (T_C=100°C)	7.6	
I_{DM}	Drain Current - Pulsed (NOTE 1)	48	A
E_{AS}	Single Pulse Avalanche Energy (NOTE 2)	6	mJ
I_{AS}	Single Pulse Avalanche Current (NOTE 2)	11	A
P_D	Power Dissipation (T_C=25°C)	34.7	W
	Power Dissipation - Derate above 25°C	0.27	W/°C
T_J	Operating Junction Temperature Range	-50 to 150	°C
T_{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		NM115 / DD0956	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3.1	°C/W

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=125°C	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	95	115	mΩ
		V_{GS}=4.5V , I_D=8A	---	100	125	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250uA	1.2	1.6	2.2	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=2A	---	8.7	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge (NOTE 3、4)	V_{DS}=50V , V_{GS}=10V , I_D=2A	---	20	40	nC
Q_{gs}	Gate-Source Charge (NOTE 3、4)		---	3.2	6	
Q_{gd}	Gate-Drain Charge (NOTE 3、4)		---	3.6	7	
$T_{d(on)}$	Turn-On Delay Time (NOTE 3、4)	V_{DD}=50V , V_{GS}=10V , R_G=3.3Ω , I_D=1A	---	18	36	nS
T_r	Rise Time (NOTE 3、4)		---	4	8	
$T_{d(off)}$	Turn-Off Delay Time (NOTE 3、4)		---	40	80	
T_f	Fall Time (NOTE 3、4)		---	3	6	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	1400	2800	pF
C_{oss}	Output Capacitance		---	60	120	
C_{rss}	Reverse Transfer Capacitance		---	35	70	
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2	4	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	12	A
I_{SM}	Pulsed Source Current		---	---	24	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25°C	---	---	1	V
trr	Reverse Recovery Time (NOTE 3)	I_S=1A , di/dt=100A/μs , T_J=25°C	---	38	---	nS
Qrr	Reverse Recovery Charge (NOTE 3)		---	27	---	nC

NOTES：

1. Repetitive Rating：Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=11A, R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Characteristics Curves

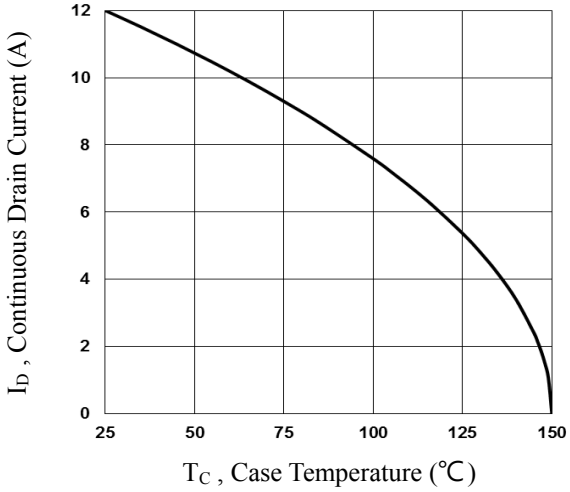


Fig.1 Continuous Drain Current vs. T_C

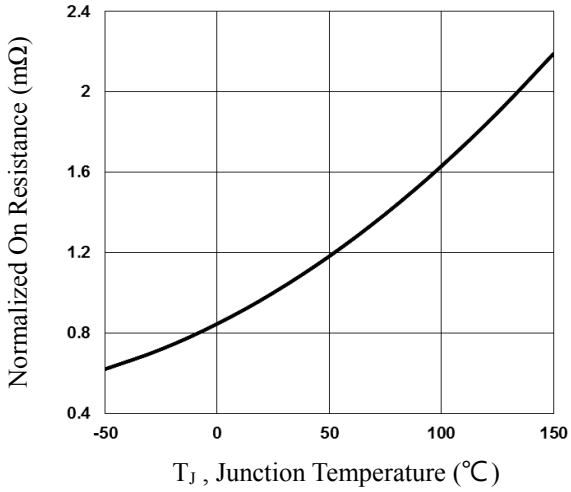


Fig.2 Normalized RDSON vs. T_J

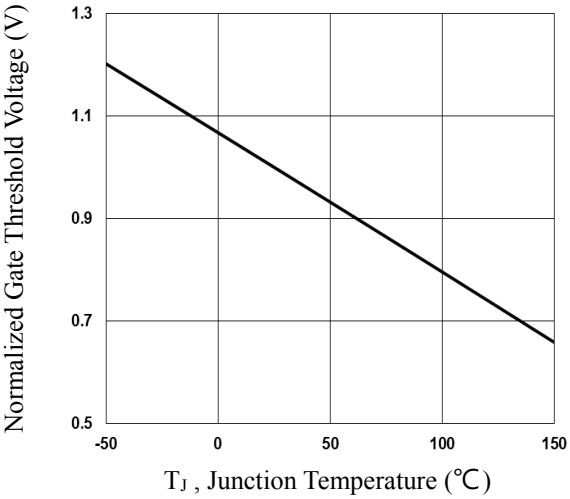


Fig.3 Normalized V_{th} vs. T_J

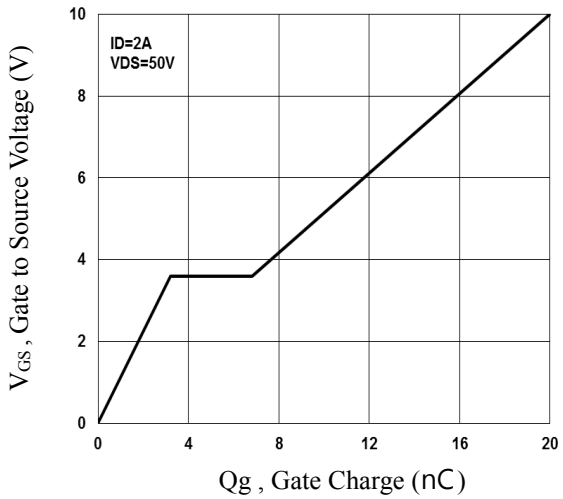


Fig.4 Gate Charge Waveform

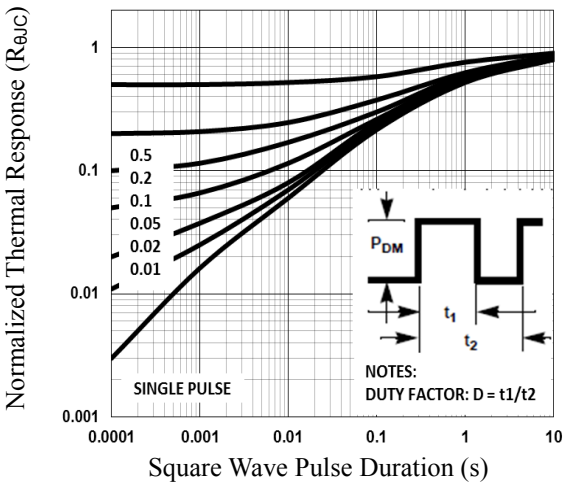


Fig.5 Normalized Transient Impedance

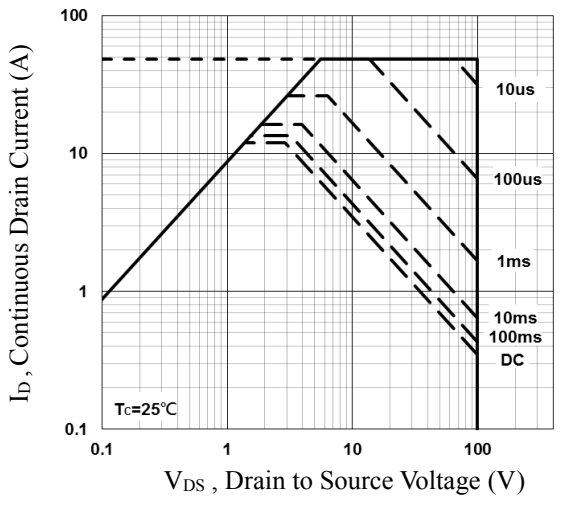


Fig.6 Maximum Safe Operation Area

Characteristics Curves

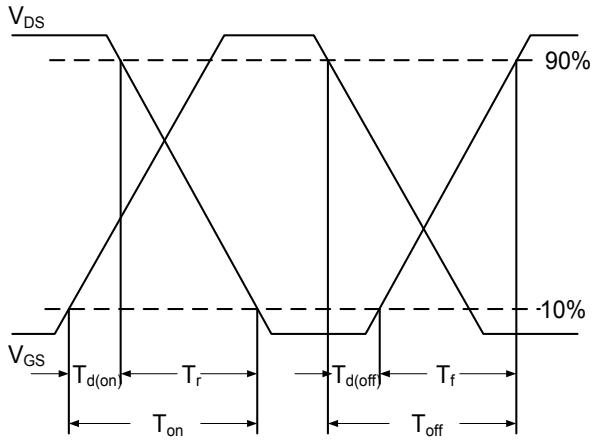


Fig.7 Switching Time Waveform

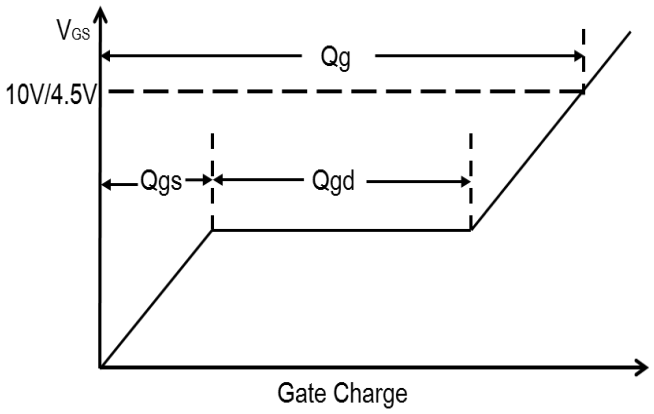
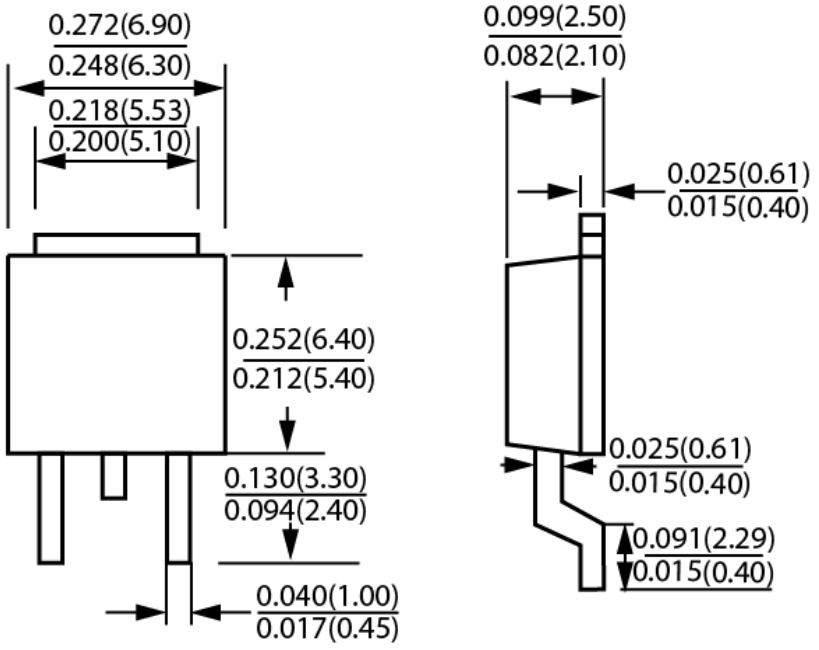


Fig.8 Gate Charge Waveform

Package Outline Dimensions



TO-252

Dimensions in inches and (millimeters)

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